User Manual
Mobile Office

LapTop with build-in Printer

DCA Intertel
Solutions for the mobile workplace

www. dca-group.com

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1.Customer Care And Service

1.1 Warranty And Repair Service

To obtain warranty or repair service please contact DCA Intertel at Phone: +31(0)172-604963 or
Fax: +31(0)172-605237 for a RMA number and shipping instructions.

1.2 Application Support

If you have any questions on operating the MP-2000 or require
information on specific applications, please contact DCA Intertel.
Phone: +31(0)172-604963 or Fax: +31(0)172-605237.

1.3 Notice

The information contained in this document is subject to changewithout notice. DCA Intertel makes no waranty of any kind with regard to this material and shall not be liable for errors contained herein or for consequential damages in connection with the furnishing, performance, or use of this material.

1.4 Warning

This equipment generates, uses, and can radiate radio frequency energy, and may cause interference to radio communications. It has been found to comply with the limits for a Class A computing device, pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause such interference that the user may be required to take measures to correct.

1.5 Limited Warranty

The MP-2000 is warranted against manufacturing defects in material for a period of one year from shipment to the purchaser. Within this period DCA Intertel will repair or replace the product without charge for material or labor. Extended warranty is available. This warranty does not cover damage or failure caused by abuse, improper maintenance, or any repairs or modifications other than those provided by DCA Intertel. DCA Intertel makes no other warranty, either expressed or implied, with respect to this product and specifically disclaims the implied warranties of merchantaility and fitness for a particular purpose and shall not be responsible for any damages arising out of or in connection with the use of this product.

2. Contents of MO 2000

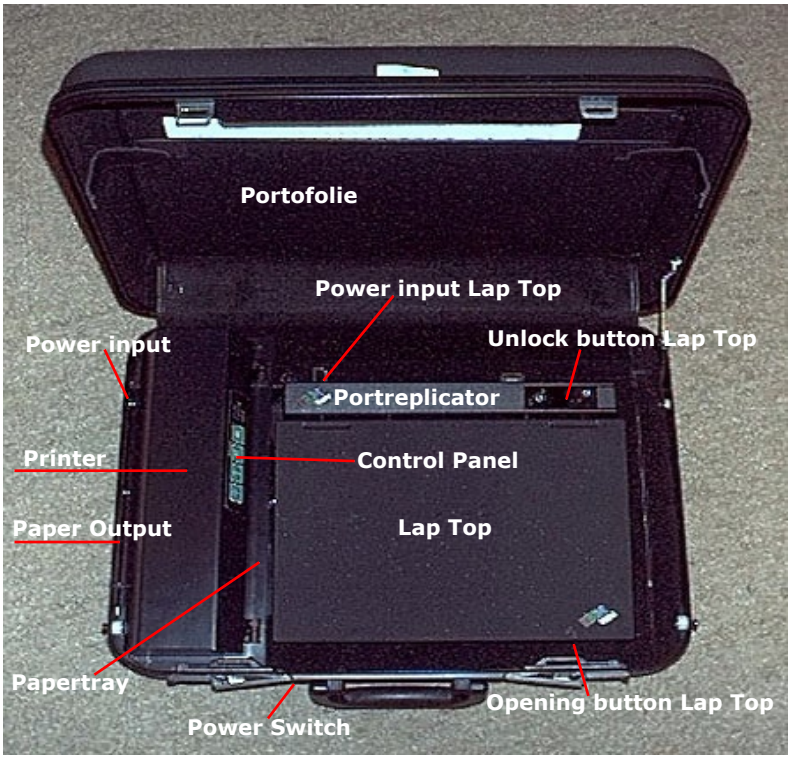
The MO 2000 will be delivered with the next items;

Rugged Executive Case with integrated;
- A4 size impact printer (MP2000)
- GSM modem (option)
- Battery Management System

Papertray
- LapTop portreplicator (delivered by client)
- LapTop and adapter (delivered by client)

Carrying Belt
Serial Cable
Portfolio
Auto/Airline power adapter IBM
User Manual
Two year warranty

3. Identifying the MO 2000



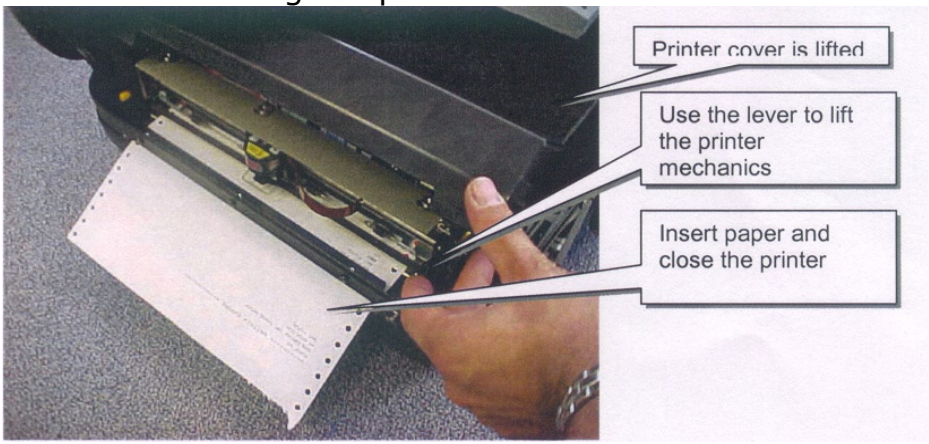
The paper-tray can be accessed by lifting up the plate on which the Lap Top is mounted. On this plate the GSM Modem (optional) can be found. By pushing the unlock button the Lap Top can be taken out of the suitcase. Additional equipment can be attached to the Lap Top by plugging it into the portreplicator.

The paper can be inserted by lifting the cover of the printer and then lifting the printer mechanism.

Notice that the suitcase have to be recharged with the IBM adapter from the Lap Top and/or with the Auto Airline adapter delivered with the suitcase.

When the battery is completely recharged you can print at least 80 pages with it.

The paper can be inserted by lifting the cover of the printer and then lifting the printer mechanics



4. How to

Power the suitcase with the red switch, left next to the handstrap of the suitcase.
The switch will indicate it is powered .
The printer will position itselve in the on-line status.
If error indication on the printer panel is flashing this is indication the
internal power is too low. Use Car adapter or the 12 VDC power adapter to
have good operation and for charging the enclosed battery.
Power on the LapTop
Set the data switch to Port
Assure the paper is correctly being fixed in the printer.
Install the MP2000 printer driver on the LapTop

For information about printer we refer to the enclosed MP2000 User Manual.

5. Description

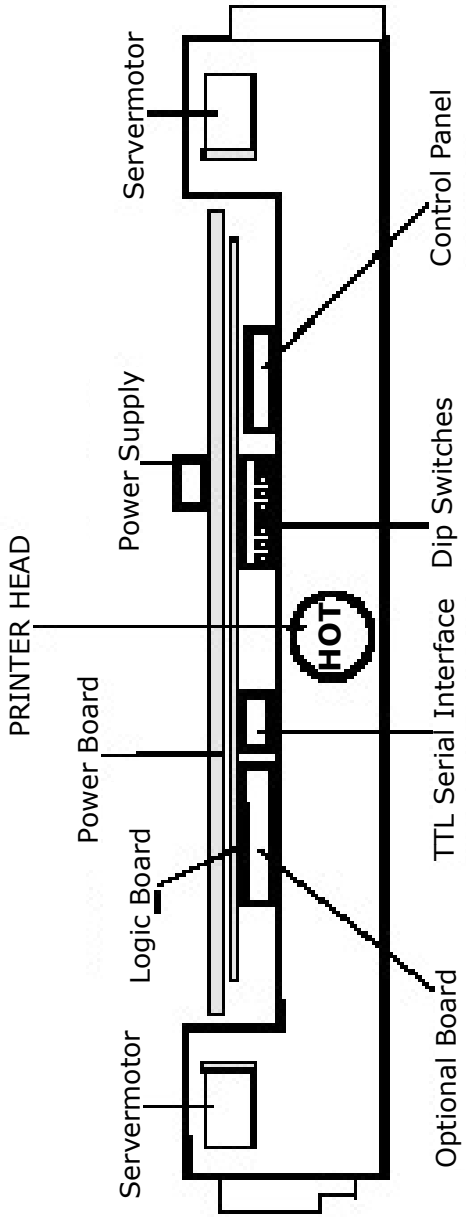
5.1 Printer Overview

The MP- 2000 Mobile Printer is a ruggedized dot matrix printer
designed specifically for mobile and portable applications. It can
print in graphics mode along with different character fonts, both in draft (150 cps) and NLQ (25 cps) mode. It has both tractor and friction feed mechanisms and can print on multi-copy paper
(1 original and up to 3 copies).

MP- 2000 is particularly suited for portable applications, due to its
compact size and reduced weight. Power requirements have been kept to a minimum bij means of two DC motors with integrated optical encoders, and an integrated driver board for precise positioning rather than stepping motors.

MP- 2000 has a 2 Kbytes input buffer and comes with an RS-232
serial interface. The MP 2000 driver software supports DOS, Windows NT, Windows '95 and is compatible to the commandset of EPSON LX 400/800.

5.2 Printer Layout



6. Technical Specifications

Weight:	2,2 kg.
Power:	11-14,0 Volts DC 85 mA Standby 2.5 A at medium print density
Print:	Impact Dot Matrix, 9 pins Bi-directional with logic seeking
Paper Feed:	Bi-directional, Sprocket and friction
Copies:	1 original, 3 copies
Speed:	150 cps Draft
Paper Speed:	7 lines/second at 1/6” 13 lines/second continuous
Print Width:	8.25”
Paper Width:	8.93” pin to pin (sprocket) 3.5-8.5” tickets
Dots/Line:	1920 Max
Char. Set:	IBM graphic bit image
Ribbon Life:	Black 1.2 x 106 characters
Interface:	RS - 232
Operating temp:	+ 5 C.....+ 40 C
Non operating:	-15 C ..... +70 C
MIL SPEC:	810 D/E Shock and Vibration Printer Operation

7. Installation

7.1 Unpacking

Take the printer out of its shipping box and remove any packing material. It is advisable to keep the shipping box in case the printer needs to be reshipped or stored elsewhere.

7.2 Procedure for Installation

7.2.1Mechanical installation

The MP-2000 can print in any position

7.2.2 Driver installation

MP-2000 driver software supports DOS, Windows NT, Windows '95 and is EPSON LX 400/LX 800 compatible and it can therefore be configured as such in the majority of the software packages.

7.3 Printer Setup

The MP-2000 can be configured by using the DIP-switches as
shown in Fig. 1. The function of the DIP-switches is depicted
in Table 1.

TABLE 1 - DIP SWITCHES

Dip Switch	Function
SW 1-1	Baud rate (see Table 2)
SW 1-2	Baud rate (see Table 2)
SW 1-3	for serial interface:
	ON=XON/XOFF mode
	OFF=DTR/DSR mode
SW 1-4	Character set
SW 1-5	Character set
SW 1-6	Character set
SW 1-7	CRLF mode: ON = enabled
	OFF = disabled
SW 1-8	STAND-BY mode: ON = enabled
	OFF = disabled

NOTE: Standard factory setting: SW 4,5,6, ON.

TABLE 2 - BAUD RATE SELECTION

Baud Rate	SW 1-1	SW 1-2
1200	ON	ON
2400	OFF	ON
4800	ON	OFF
9600	OFF	OFF

CRLF mode = ON means that after every CR character (carriage return) sent by the host, the printer automatically performs a LF (Line Feed)
operation.

STAND-BY mode = ON means that after a certain pre-set inactivity period, the printer goes to stand-by mode (reduced power drain).

If DIP-switch setting is switched ON while the printer is on, the new configuration will come into effect only after a subsequent printer turn-off and turn-on cycle.

7.4 Caution!

* Do Not print without inked ribbon or paper, since this leads to rapid printhead needle wear- out.

* Do Not move the printhead manually.

* Avoid mechanical shocks.

* Before starting to print, check that the inked ribbon cartridge is correctly installed, the paper is loaded in the proper position and the printer's upper swiveling part is locked to the lower one.

* If the printer has worked for some time, avoid touching the printhead: it can be very hot. It is advisable to wait a few minutes before attempting to replace the inked ribbon cartridge.

* Once the printer has been turned off, wait at least 10 seconds before turning it on again; this allows the internal reset circuitry to work properly.

* Do Not open the printer when it is operating.

NOTICE
Turn the computer on before the printer and turn the printer off before the computer. This is only to avoid dummy data to be sent by the computer printer during the on/off sequence.

NOTE:
The small size of the printhead did not allow for a head-paper spacing adjustment device to be used in single-copy or multi copy printing. Therefore, when multi-copy printing is performed with a freshly installed inked ribbon cartridge, the first printed pages may have some ribbon marks.

7.5 Self Test

The printer is able to perform an internal self-check routine followed by a self-test printout.

To execute this procedure, simply keep the LINE feed push-button pressed while the printer is powered up. The test procedure prints a first page with general information about the MP-2000 and a second page of fonts.

CAUTION
DO NOT SELF TEST WITHOUT INKRIBBON OR PAPER.

7.6 Indicators

POWER ON
This indicator lights when the printer is correctly powered. If the supply voltage drops below 11.5 Vdc, the POWER indicator flashes.

ON LINE
Turns on when the printer is ready to accept data. If the ON LINE indicator flashes, the printer has switched to STAND- BY mode.

PAPER END
Comes on when the printer is out of paper.

7.7 Alarm and Indicator Functions

The following description assumes that the control panel with associated indicators and alarm is connected to the printer.

ERROR indicator flashes
This means that the motor is locked due to some mechanical reason; it is recommended to turn the printer off to avoid battery pack overcharging.

8. Printer Operation

The MP-2000 control panel is fitted with four control keys, three
indicators of which one is an alarm indicator.

8.1 Control Keys

This key switches the printer on and off. When ON LINE, the
printer is ready to accept data from the computer. Likewise when it is switched OFF LINE, the carriage automatically moves to the center of the printer span. When ON LINE the printer ignores the remaining push-buttons. If the printer is switched ON LINE when the LINE FEED push-button is activated, a demonstration test is performed.

ONLINE Paper End Error

This key advances the paper by one sheet length (i.e. to the beginning of next page).

This key advances the paper by one line.

This key retracts the paper by one line.

8.2 Power Source

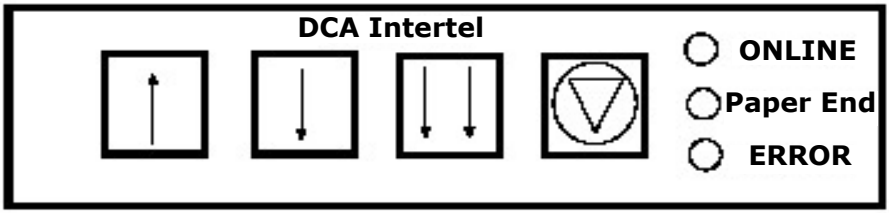
The MP-2000 requires a power source between:

* 11.0 - 14,0 VDC

* If the voltage drops below 11.5 VDC, the POWER ON indicators flashes.

* If the voltage drops below 10.5 VDC (batteries drained) the printer stops.

CONTROLPANEL



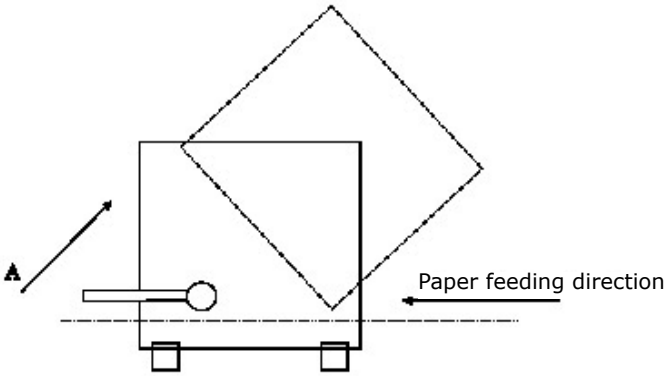
8.3 Paper Loading

MP-2000 can print on UNI A4/A5 size single sheet paper forms or multi part paper forms or continuous fan-fold paper with hole to hole spacing of 227mm (8.94”).

The procedure for correct paper loading is the following:

- Set the printer OFF LINE
- Open the printer by lifting lever A (Fig. 2.)
- Insert single-sheet module by placing it over the printing plate, while checking if it is equally spaced with respect to the printing area; in case of continuous fan-fold paper, be sure that the sprockets engage correctly in the holes provided for near the edges.
- Close the swiveling printer top.
- Switch the printer ON LINE again.

CAUTION
If the printer has been printing for some time it is advisable not to touch the printhead during paper loading or inkribbon cartridge replacement, as it could be very hot.



8.4 Sensors

A reflective sensor is used on MP-2000 for determining the PAPER END condition. When this sensor detects the end of the currently printed sheet, the following actions take place:

1. printing stops.

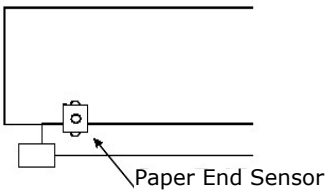
2. the printer switches to OFF LINE (ON LINE indicators goes off).

3. PE (PAPER END) indicators comes on.

4. carriage moves to middle of the printer span.

In order to resume printing, a new sheet should be loaded and the ON LINE pushbutton should be pressed

The PAPER END sensor is also used to detect an "open mechanism" condition. When the mechanism is open, the sensor no longer sees the sheet and actions described above take place. The carriage is likewise moved to the center until a new sheet is introduced, the printer mechanism is closed and the ON LINE push-button is pressed.



8.5 Maintenance

The MP 2000 does not require special maintenance, except for the following:

-periodic cleaning, approximately every 10 million characters, of the printhead bearing rod with isopropylic alcohol or similar.
verification of the distance between printhead and printing plate (if the printer has suffered major shock or whenever an appreciable occurrence of bad quality printing is experienced). The distance, measured by a thickness gauge with the printer closed and no inked ribbon interposed, should be 0.55 mm +/- 0.05 mm.

-periodic cleaning of the printer's mechanism, in order to avoid dust particles, paper clips and the like, can cause mechanism malfunctions.

8.7 Replacement

Cartridge installation/replacement procedure:

- Turn the printer off.
- Remove used cartridge by unlocking bottom latch and then rotating cartridge body upwards as shown by arrow D.
- Place ribbon extender on both studs B until it locks down, paying attention to the ribbon not disengaging from the extender itself.
- Gently move the cartridge body along the printing axis and seat it down on its holder C; the ribbon should be made to enter partly in the gap between the steel-wire ribbon holder and the printhead nose.
- Stretch the inked ribbon by turning knob A counter-clockwise. Turn the printer on without loading any paper; make sure that after the switch-on side movement of the printhead, the ribbon is properly positioned under printhead’s nose.

9. Interfaces

9.1 Appendix A:

The printer comes with standard RS 232 Serial Interface

PIN	SIGNAL	SIGNAL	PIN
01	Carrier Detect	Frame Ground	01
03	Transmit Data	Receive Data	02
02	Receive Data	Transmit Data	03
06	DSR-Data Set Ready	DTR-Data Terminal Ready	04
05	Signal Ground	Signal Ground	05
08	CTS-Clear To Send	RTS-Request To Send	07
07	RTS-Request To Send	CTS-Clear To Send	08
04	DTR-Data Terminal Ready	DSR-Data Set Ready	06
09	(Not Connected)	(Not Connected)	09

RS232 SERIAL INTERFACE CONNECTORS

9.2 Appendix B:

CHARACTER SET
ASCII 256 IBM

DEC.	HEX.	Characters	control key	ASCII name
000	00	NUL	Ctrl @	null
001	01	SOH	Ctrl A	start of heading
002	02	STX	Ctrl B	start of text
003	03	ETX	Ctrl C	end of text
004	04	EOT	Ctrl D	end of transm.
005	05	ENQ	Ctrl E	inquiry
006	06	ACK	Ctrl F	acknowledge
007	07	BEL	Ctrl G	bell
008	08	BS	Ctrl H	back space
009	09	HT	Ctrl I	horizontal tab
010	0A	LF	Ctrl J	line feed
011	0B	VT	Ctrl K	vertical tab
012	0C	FF	Ctrl L	form feed
013	0D	CR	Ctrl M	carriage return
014	0E	SO	Ctrl N	shift out
015	0F	SI	Ctrl O	shift in
016	10	DLE	Ctrl P	data link escape
017	11	DC1	Ctrl Q	control device 1
018	12	DC2	Ctrl R	control device 2
019	13	DC3	Ctrl S	control device 3
020	14	DC4	Ctrl T	control device 4
021	15	NAK	Ctrl U	negative acknowl.
022	16	SYN	Ctrl V	synchronous idle.
023	17	ETB	Ctrl W	end of transm.
024	18	CAN	Ctrl X	cancel line
025	19	EM	Ctrl Y	end of medium
026	1A	SUB	Ctrl Z	substitute
027	1B	ESC	Ctrl [	escape
028	1C	FS	Ctrl \	file seperator
029	1D	GS	Ctrl]	group seperator
030	1E	RS	Ctrl ^	record seperator
031	1F	US	Ctrl _	unit seperator

9.3 Appendix C:

DEC	ASC	DEC	ASC	DEC	ASC	DEC	ASC
0	NUL	32	SP	64	@	96	`
1	SOH	33	!	65	A	97	a
2	STX	34	"	66	B	98	b
3	ETX	35	#	67	C	99	c
4	EOT	36	$	68	D	100	d
5	ENQ	37	%	69	E	101	e
6	ACK	38	&	70	F	102	f
7	BEL	39	`	71	G	103	g
8	BS	40	(	72	H	104	h
9	HT	41	)	73	I	105	i
10	LF	42	*	74	J	106	j
11	VT	43	+	75	K	107	k
12	FF	44	,	76	L	108	l
13	CR	45	-	77	M	109	m
14	SO	46	.	78	N	110	n
15	SI	47	/	79	O	111	o
16	DLE	48	0	80	P	112	p
17	DC1	49	1	81	Q	113	q
18	DC2	50	2	82	R	114	r
19	DC3	51	3	83	S	115	s
20	DC4	52	4	84	T	116	t
21	NAK	53	5	85	U	117	u
22	SYN	54	6	86	V	118	v
23	ETB	55	7	87	W	119	w
24	CAN	56	8	88	X	120	x
25	EM	57	9	89	Y	121	y
26	SUB	58	:	90	Z	122	z
27	ESC	59	;	91	[	123	{
28	FS	60	<	92	\	124	|
29	GS	61	=	93	]	125	}
30	RS	62	>	94	^	126	~
31	US	63	?	95	_	127	DEL

DEC	ASC	DEC	ASC	DEC	ASC	DEC	ASC
128	€	160		192	À	224	à
129	□	161	¡	193	Á	225	á
130	‚	162	¢	194	Â	226	â
131	ƒ	163	£	195	Ã	227	ã
132	„	164	¤	196	Ä	228	ä
133	…	165	¥	197	Å	229	å
134	†	166	¦	198	Æ	230	æ
135	‡	167	§	199	Ç	231	ç
136	ˆ	168	¨	200	È	232	è
137	‰	169	©	201	É	233	é
138	Š	170	ª	202	Ê	234	ê
139	‹	171	«	203	Ë	235	ë
140	Œ	172	¬	204	Ì	236	ì
141	□	173		205	Í	237	í
142	Ž	174	®	206	Î	238	î
143	□	175	¯	207	Ï	239	ï
144	□	176	°	208	Ð	240	ð
145	‘	177	±	209	Ñ	241	ñ
146	’	178	²	210	Ò	242	ò
147	“	179	³	211	Ó	243	ó
148	·	180	´	212	Ô	244	ô
149	·	181	µ	213	Ö	245	õ
150	–	182	·	214	Ö	246	ö
151	—	183	·	215	×	247	÷
152	˜	184	¸	216	Ø	248	ø
153	™	185	¹	217	Ù	249	ù
154	š	186	º	218	Ú	250	ú
155	›	187	»	219	Û	251	û
156	œ	188	¼	220	Ü	252	ü
157	□	189	½	221	Ý	253	ý
158	Ÿ	190	¾	222	Þ	254	þ
159	Ÿ	191	¿	223	ß	255	